

Serial No. 10/681,519

Attorney Docket No. 2001P23807US

### REMARKS

Claims 12-14, 16-18 and 20-24 stand rejected as being anticipated by European patent No. EP 0900919 (hereinafter Uematsu). Claims 12, 13, 15, 18 and 18 stand rejected as being anticipated by European patent No. EP 0806544 (hereinafter Suenaga). Claims 15 and 19 stand rejected as being unpatentable over Uematsu in view of US pat. No. 3,572,966 (hereinafter Borden). Claims 16 and 20 stand objected to in view of some informalities noted in the Office Action. Applicant respectfully requests reconsideration and allowance of the pending claims in view of the foregoing amendments and the discussion below.

Claims 12 and 18 have been amended to emphasize aspects of the present invention. Claims 16 and 20 were amended to correct the informalities noted in the Office Action. Claims 1-11 were previously canceled. Claims 21-24 have been canceled in this response. Thus claims 12-20 are pending in this application.

#### **Claims 12-14 and 16 are patentable over Uematsu:**

Claim 12 is directed to a turbine shaft in a turbine engine. The turbine shaft includes a first cooling circuit characterized by a first region (8) separated flow wise from a third region by a second region (9). The first cooling circuit is further characterized by a fourth region, a fifth region (20) and a sixth region connected flow wise to one another to pass fresh air (10) but separated flow wise from the first, second, and third regions. The first region (8) contains live steam during operation. The third region contains used steam during operation. The second region is located within a first blade. The fourth region is located within a first guide vane (15) to pass fresh air therethrough to the fifth region (20). The fifth region (20) passes fresh air received from the fourth region to the sixth region, which is located within the first blade and passes therethrough fresh air received from the fifth region (20). The turbine shaft includes a second cooling circuit

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characterized by a first region separated flow wise from a third region by a second region. The second cooling circuit being further characterized by a fourth region, a fifth region and a sixth region connected flow wise to one another to pass fresh air but separated flow wise from the first, second, and third regions. The first region contains live steam during operation. The third region contains used steam during operation. The second region is located within a second blade. The fourth region is located within a second guide vane to pass fresh air therethrough to the fifth region. The fifth region passes fresh air received from the fourth region to the sixth region. The sixth region is located within the second blade and passes therethrough fresh air received from the fifth region. Each first region is in communication flow wise with a source of live steam during operation, and each of the cooling circuits is effective to maximize cooling efficiency by delivering live steam to each of the cooling circuit first regions and by delivering fresh air through the fourth, fifth and sixth regions.

Basis for the foregoing amendment regarding the use of fresh air may be found at least in paragraphs 22 and 23 and in FIG. 1 of the published application of the present invention. Uematsu fails to describe or suggest cooling circuits that integrate the use of steam and fresh air as set forth in claim 12. Accordingly, applicant respectfully requests allowance of independent claim 12 and claims 13-14 and 16, which depend on claim 12.

**Claims 18, 20 are patentable over Uematsu:**

Uematsu also fails to describe or suggest cooling circuits that integrate the use of steam and fresh air as set forth in claim 18. Consequently, applicant respectfully requests allowance of independent claim 18 and claim 20, which depends on claim 18.

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**Claims 12, 13 and 15 are patentable over Suenaga:**

It is not seen that Suenaga describes or suggest any cooling circuits that integrate the use of steam and fresh air as set forth in claim 12. Accordingly, applicant respectfully requests allowance of independent claim 12 and claims 13 and 15, which depend on claim 12.

**Claims 18 and 19 are patentable over Suenaga:**

It is also not seen that Suenaga describes or suggest any cooling circuits that integrate the use of steam and fresh air as set forth in claim 18. Consequently, applicant respectfully requests allowance of independent claim 18 and claim 19, which depends on claim 18.

**Claims 15 and 19 are patentable over Uematsu in view of Borden:**

Borden fails to remedy the deficiencies of Uematsu regarding any cooling circuits that integrate the use of steam and fresh air as set forth in claim 12 or in claim 18. Accordingly, the combination of Uematsu and Borden fails to render claims 15 and 19 unpatentable and should be withdrawn.

In view of the foregoing remarks, applicant respectfully requests allowance of the pending claims.


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**Conclusion**

For the foregoing reasons, it is respectfully submitted that the rejections set forth in the outstanding Office Action are inapplicable to the present claims. Accordingly, applicant respectfully requests that the Examiner reconsider the rejections and timely pass the application to allowance. Please grant any extensions of time required to enter this paper. The commissioner is hereby authorized to char any appropriate fees due in connection with this paper, including the fees specified in 37 C.F.R. §§ 1.16 (c), 1.17(a)(1) and 1.20(d), or credit any overpayments to Deposit Account No. 19-2179.

Respectfully submitted,

Dated: 4/10/06

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